Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at http://about.jstor.org/participate-jstor/individuals/early-journal-content.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

THE
AMERICAN NATURALIST

VOL. LI. April, 1917 No. 604

THE SOURCES OF ANATOMICAL LITERATURE

PROFESSOR ROY L. MOODIE

DEPARTMENT OF ANATOMY, UNIVERSITY OF ILLINOIS, CHICAGO

THE study of anatomical literature has not received the attention that has been given the writings of men in other lines of intellectual endeavor. When we compare, for instance, our knowledge of the literature of anatomy, and the men who have made this literature, with the work that has been done on the history of poetry and the poets, or fiction, or the history of nations, we see how greatly the development of anatomical knowledge and literature has been neglected. Locy[1] especially has shown us how this field of study may be used as a field of research in early human documents relating to anatomy. The subject has been further developed by Stieda, Holl,[2] Sudhoff,[3] Forster,[4] McMurrich,[5] Roth,[6] Töply[7] and others who have contributed sundry studies along these lines. That there has been no great amount of attention paid to the subject is probably due to the fact that the subject matter of anatomy has been and is of more interest than the form in which it is presented.

---

[1] *Journal of Morphology,* Vol. 22, pp. 945–988, 1911.

[2] *Archiv für Anatomie und Physiologie,* Anat. Abth., Jahrgang, 1905, p. 96.

[3] Karl Sudhoff is editor of the *Archiv für die Geschichte der Medizin,* to which he is an active contributor (especially to be noted are his original contributions concerning medieval anatomical knowledge) and he is also the editor of Pagel's "Einführung in die Geschichte der Medizin."

[4] *Archiv für Anatomie und Physiologie,* Anat. Abth., 1904, pp. 372–384.

[5] *Medical Library and Historical Journal,* Vol. 4, pp. 338–350, 1906.

[6] *Archiv für Anatomie und Physiologie,* Anat. Abth., 1905, p. 79; 1906, p. 77.

[7] Anatomische Hefte, Bd. 25, Erste Abth., pp. 351–398, 1904.

There have been a number of classical studies in the history of anatomy, the latest and best of which is that by Töply.[8] Other and earlier studies to be mentioned are the productions of Lauth,[9] Haller,[10] Portal,[11] LeClerc and Manget,[12] Tarin,[12a] James Douglas,[12b] Goelickius and many other early attempts at bringing together the results of anatomical study.

More recently the work of Daremberg in France,[13] Carus,[14] Wieger,[15] Weindler,[16] and Hopf[17] in Germany; Osawa[18] in Japan, Bardeen[19] in America, and Chievitz[20] in Denmark are to be especially mentioned.

Besides the results contained in the above-mentioned works there is much information to be gleaned from the numerous histories of medicine and especially from the biographical dictionaries of Panckoucke,[21] Gurlt und Hirsch,[22] Pagel,[23] and the various biographical encyclopedias. Much valuable biographical data of many biologists is to be found in the "Nouveau Larousse Illustré," as well as in other general encyclopedias.

---

[8] Geschichte der Anatomie, in ''Handbuch der Geschichte der Medizin,'' begründet von Th. Puschmann, herausgegeben von Max Neuberger und Julius Pagel, Bd. II, pp. 155–326, 1903.

[9] Thomas Lauth, 1815, ''Histoire de l'anatomie,'' Strassburg. Up to the time of Thomas Bartholin, 1671.

[10] Albrecht von Haller, 1774–1777, ''Bibliotheca Anatomica,'' Tomes I–II.

[11] Antoine Baron Portal, 1770–1773, ''Histoire de la anatomie et de la chirurgie,'' Paris, Tomes I–VI.

[12] Daniel LeClerc and Jacob Manget, 1685, ''Bibliotheca Anatomica.''

[12a] Pierre Tarin, 1753, ''Dictionaire Anatomique.''

[12b] James Douglas, 1715, ''Bibliographiæ Anatomicæ specimen, seu catalogus omnium pene auctorum, qui rem anatomicum professo vel obiter scriptis illustrarunt.''

[13] Ch. Daremberg, 1870, ''Histoire des sciences médicales comprenant l'anatomie, la physiologie, la médicine, la chirurgie et les doctrines de pathologie générale.'' 2 tomes.

[14] J. Victor Carus, 1872, ''Geschichte der Zoologie, bis auf Joh. Mueller und Charl. Darwin.''

[15] Friedrich Wieger, 1885, ''Geschichte der Medizin und ihrer Lehranstalten in Strassburg vom Jahre 1497 bis zum Jahre 1872.''

[16] Fritz Weindler, 1908, ''Geschichte der gynaekologisch-anatomischen Abbildung.''

[17] Ludwig Hopf, 1904, ''Die Anfänge der Anatomie bei den alten Kulturvölkern.'' Abhandl. zur Geschichte der Medizin, Heft IX, Breslau.

[18] Gakutaro Osawa, 1895, ''Zur Geschichte der Anatomie in Japan.'' Vortrag gehalten in der Naturforscher-Ges. zu Freiburg i.B. am 20, Nov. 1895. A.A.B. 11, N. 16/17, pp. 489–504, 2 Abb.

[19] Charles R. Bardeen, 1905, ''Anatomy in America,'' *Bulletin of the University of Wisconsin,* No. 115.

[20] I. H. Chievitz, 1904, ''Anatomiens historie,'' Copenhagen.

Even a hasty survey of the geographical development of anatomical literature will suffice to show that the continents of Europe and North America are the chief ones to be considered. Asia, Africa, Australia and South America each come in for some slight claim to attention, as will be evident from the discussion of the geographical distribution of anatomists given below.

It can not be said that all of the men considered in making up the list referred to below have contributed new ideas to anatomy. Many have not. None of the Romans were men of original ideas, at least so far as a knowledge of anatomy is concerned. Celsus is the only Roman whose knowledge of anatomical subjects demands any sort of respect and his knowledge, as given in the "De Medicina," is not acquired first hand although he is to be greatly respected for producing a medical classic.

Stieda[23a] has shown, however, that the Romans were not entirely devoid of anatomical knowledge, though this knowledge was often erroneous. The "Donaria" described and figured by Stieda are supposedly offerings to the deity in connection with the suppliant's plea for health. The part offered, in the form of a model of a leg, foot, breast, viscera or head, indicates the region in which the suppliant suffered and from which distress he wished to be relieved. The objects are of marble and bear the date of about the first century B.C. They are, for the most part, crudely done and can not be taken as indicating any attempt to illustrate anatomy. Often the internal parts shown bear some resemblance to the human structures. Occasionally the liver of a mammal is incorporated in the same piece with the human heart and lungs. The viscera are very crude and can not be taken as indicating any degree of positive knowledge concerning the parts shown.

---

[21] C. L. F. Panckoucke, 1820, "Dictionaire des Sciences Médicales-Biographie Médicale," 7 volumes.

[22] "Biographisches Lexikon hervorragender Aerzte aller Zeiten und Völker," 1884–88, 6 volumes.

[23] "Biographisches Lexikon hervorragender Aerzte des XIX. Jahrhunderts," 1901.

[23a] Ludwig Stieda, 1901, "Anatomisch-Archäologische Studien," II. Anatomisches über alt-italische Weihgeschenke (Donaria), Anatomische Hefte, Bd. XVI, pp. 1–84, Taf. I–IV.

None of the Arabians produced original ideas or literature concerning anatomy. Abdollatif (1162–1231) is the only one of the Arabians who departed in the slightest degree from the writings of Galen and Hippocrates. While in Egypt he was studying some human bones in a cemetery when he ascertained that the jaw is formed of one piece; that the sacrum, though sometimes composed of several, is most generally of one. On the basis of these observations he criticized the writings of Galen and thus showed himself to be a man of original ideas.

Flores[24] in his "History of Medicine in Mexico" has listed the following teachers of anatomy in the University of Mexico: Febles, Benítez, García, Cheyne, Peña, García Cabezon, Rendon, Escobedo, Villar, Jecker, M. Andrade, Muñoz, Villagran, Durán, F. Ortega, Chacon, Montes de Oca, Velasco, San Juan, and Cordero é Icaza, but, so far as I have been able to ascertain, none of these men have been productive.

There is no Egyptian literature of anatomy, and apparently there was no definite knowledge of anatomical structure. The practise of embalming had attained at one period great perfection in Egypt and this may have resulted in a certain degree of anatomical knowledge, but it was so overclouded by religious fanaticism and superstition that it amounted to little. Thus McKay[24a] says: "The Egyptians probably knew next to nothing about anatomy, as their religion forbade dissection, and the embalmers probably learnt little. After the Paraschistes had made the preliminary abdominal incision, the Taricheutae were accustomed to pass their hands through the incision into the body and remove the heart and kidneys and digestive organs. If they were accustomed to remove the uterus and ovaries, they must have gained some knowledge of the organs, but we have no authority for saying that the uterus was really removed. The custom that the Egyptians followed, that of making models of the parts[24b] that had been healed and then hanging them in the temples, may have been useful for clinical instruction.''

---

[24] Francisco A. Flores, 1888, "Historia de la Medicina en Mexico desde la epoca de los Indios hasta la Presente," Tomo I–III.

[24a] W. J. S. McKay, 1901, "The History of Ancient Gynaecology," New York, p. 6.

Among the Hebrew peoples of ancient times sacrifices (Genesis xv. 9–10) were common, and the appearance of the viscera of the animals sacrificed were probably familiar. This may have resulted in a degree of anatomical knowledge. There are, apparently, no definite statements concerning anatomical matters in the Bible, the information there given being of a purely popular character. In the Babylonian Talmud, however, there are a number of references[25] to subjects of anatomical interest. The number of bones in the skeleton is estimated at 248 or 252, and one of these, the bone Luz, which was supposed to be situated somewhere between the base of the skull and the coccyx, was regarded as the indestructible nucleus from which the body is to be raised from the dead at the resurrection.[26] The Talmud also displays some knowledge of the esophagus, larynx, trachea, and the membranes of the brain. The pancreas and other internal organs are briefly referred to.

Among the ancient peoples who thrived in and around Mesopotamia there is, apparently, no anatomical literature. What little of anatomy may have been known was acquired through religious observances, such as auguries and sacrifices. Stieda[27] especially has studied the indications of anatomical knowledge among these ancient peoples as this knowledge has been preserved in their sculptures. It is a matter of great interest that he has interpreted a terra-cotta object from Babylon, to which an age of from 2000–3000 B.C. may be assigned, as a model of a sheep's liver, supposedly used in connection with soothsaying or with sacrifices. This interpretation is sustained by the description of two other similar objects of a later date, one in alabaster from Piacenza, and a bronze liver from Settina. One can recognize on the visceral surface of these objects the processus papillaris, the processus caudatus, and the vesica fellea; all of which are very clearly represented. The lower surface of the object from Babylon is divided into squares and studded with inscriptions, supposedly of a prophetic nature.

[24b] These were ''Donaria'' and the custom was doubtless derived from the Romans.

[25] Julius Preuss, ''Biblisch-Talmudische Medizin,'' Berlin.

[26] F. H. Garrison, *N. Y. Med. Jour.*, 1910, Vol. 92, pp. 149–151.

[27] Ludwig Stieda, *Anatomische Hefte*, Bd. 15, pp. 673–720, Taf. 57.

In addition to these very definite anatomical models many plastic representations exhibit some knowledge of the superficial musculature of the extremities. The larger subcutaneous veins, such as the cephalic, basilic, and saphenous, are often clearly shown. From an anthropological standpoint it is noteworthy that various racial types are indicated in some of the representations of the head, so that we can not say that these peoples were entirely devoid of anatomical knowledge and we are forced to admit their keen powers of observation.

Such anatomy as was taught to students in the medical schools of China was highly erroneous and fanciful. Although the study of medicine has a very ancient history in China, as ancient as the history of its civilization, going back to more than 3000 years B.C., anatomy was not studied at all in any laboratory form. They taught, for instance, that there are 365 bones in the human body; that the small intestines were attached to the heart; that they were traversed by the products of digestion; that the larynx opens into the heart; the spinal cord into the testicles, that the lung has eight lobes; the liver seven, that the kidneys, suspended the vertebral column, have the form of an egg and possess the subtle principle of generating the spermatic fluid, primarily elaborated by the brain, condensed in the testes and from there conveyed to the spermatic duct. Osteology was somewhat better known, although the skull, pelvis, forearm and leg were regarded as being formed of one bone each, or at times eight bones were assigned to the head in the male and six in the female. Something was known of the tendons and ligaments. The spleen and heart were regarded as the organs of reason. Ancient Chinese medical literature consists of a large number of works, none of which are of any scientific importance. There is no modern Chinese anatomical literature.

What little of anatomy was known in ancient India is contained in the writings of Atreya, a physician who wrote a good description of the bones of the human body, and who is said to have taught in the Taxila University during the sixth century B.C.; as well as in the writings of the surgeon Susruta, of a somewhat later date. As the writings of these men have been interpreted by Charaka, ancient East Indian anatomy regarded the body of man as possessing seven skins, seven elements, 300 bones, 24 nerves, 3 fluids, 107 joints, or 68 movable joints and 142 immovable ones, 900 ligaments, 90 tendons, 40 principal blood vessels with 700 branches, and 500 muscles. The blood vessels and nerves[28] radiated out from the umbilicus as a center. Nothing was known of the courses of these structures within the body.

There is a later publication of about A.D. 800 entitled "Amarakosha," which discusses somewhat the nature of the human body but there is no later treatise which might be termed anatomical, and there is no modern East Indian anatomical literature.

While engaged in a biographical study of the men who have contributed to the advancement of our knowledge of vertebrate anatomy, the writer has been attracted by a number of interesting facts relating to the sources of anatomical literature, which, he believes, are not generally recognized. The following preliminary study is an attempt to arrive at some conclusions as to the origin and development of our modern anatomical literature. It is presented here in anticipation of further studies along these lines.

---

[28] Haeser, "Lehrbuch der Geschichte der Medizin," Bd. I, p. 18–20.

The names of the men included in the above-mentioned study are of those anatomists, or contributors to anatomical literature, who are no longer living, and who have contributed in any way to the anatomy of the vertebrates, whether by practical or theoretical studies. The men of all countries and all times have been listed, so far as it has been possible to ascertain them. Doubtless many have been overlooked because their records are in relatively obscure places.

The subjects represented in the present study are: human anatomy, artistic anatomy, anthropology, comparative anatomy, embryology, histology, zoology, vertebrate paleontology and subjects of general interest which bear theoretically on the morphology and evolution of the vertebrates, such as Mendel's work at Brünn, and the work of Darwin, Weismann, Charles Bonnet and Lamarck. It may be contended that these subjects constitute biology rather than anatomy, but biology is certainly the more inclusive term. We may, to be sure, speak of the anatomy of the bacteria and in a sense the bacteriologist is an anatomist, but for my present purpose the names of those men who have contributed to our knowledge of the morphology of the vertebrates will suffice. One of the guides, which has been useful in selecting the names suited for the list, is that of the anatomical terminology. If there are anatomical structures (such, for instance, as Hesselbach's triangle) named for the man, he is included, though this is by no means the only guide. Those men whose writings are of a strictly taxonomic nature are not included, unless important theoretical results have arisen from such writings, such as has been the case with the taxonomic work of Lamarck, Linnæus, Cuvier and others.

It is hoped later to make a comprehensive survey of the development of anatomy. Over one thousand names have been compiled, and will ultimately be studied. Eight hundred of these have already been partially examined and will shortly be published.

In the development of our anatomical literature there has been involved a whole host of men in a number of different lines of activity, which it will be interesting to discuss. Many of the men included in the list were not professional anatomists but since they contributed to the advancement of anatomical knowledge we may regard them as contributors and they are hence deserving of consideration.

As would be expected, the following survey of the anatomists indicates, in general, an intellectual development in each country at the time when other conditions, physical, social, religious and political, favored the growth of mental work among the nation, although this statement finds certain contradictions, as in the case of Michael Servetus, Abano, Fallopio, Malpighi, Vesalius, and many more of the early students especially, whose work was accomplished under adverse conditions. The dates of the majority of the anatomists who find a place in the present study belong to a period when intellectual endeavor had attained a firm place in each country. Among the Greeks for instance, there is no one who attained eminence in anatomy later than the third century A.D. No modern Greek anatomist is included in the list.

There are representative anatomists of twenty-seven nationalities, though many of the countries are not widely separated geographically. The following geographical distribution indicates nothing previously unknown, but is presented here simply as an interesting survey. There are doubtless many more men of all these nations who are deserving of mention. The list contains 1 Japanese (Mitsukuri, 1858–1909, an embryologist, who is here regarded as the only one of this nation who has occupied a high place in anatomical work); possibly also the zoologist Nishikawa and the anatomist Taguchi should be mentioned; 1 Armenian (Alcana Mosali, who in the thirteenth century wrote a treatise on the anatomy and diseases of the eye, chiefly compiled from Arabian, Chaldean, Jewish, Greek and other sources); 1 Hungarian, 1 Polish, 1 South American (Florentino Ameghino, 1854–1911, a student of vertebrate paleontology, is the only representative of the large South American continent in the list. Ameghino's attainments in vertebrate paleontology entitle him to a high place among the anatomists of the world); 1 Turk (Schanzi Zadeh Mehemmed Ataullah, a Turkish physician, who after completing his studies in Italy, published, in 1820, a work on human anatomy, in folio, illustrated with 56 copper plates); 2 East Indians (Atreya, a physician, who was a teacher in the Taxila University in the sixth century B.C. He wrote an osteology, which was later edited by one of his students, Charaka. Susruta, an East Indian surgeon also deserves mention), 2 Bulgarians, 3 Flemish (of whom the greatest was Vesalius), 4 Romans (none of them men of originality), 5 Russians, 5 Belgians, 7 Irish, 7 Swedish, 7 Spanish, 7 Bohemians, 9 Arabians (Abdallatif, Albucasis, Avicenna and others), 11 Scottish, 12 Danish, 16 Swiss, 17 Austrians, 22 Greek, 36 American, 40 Dutch, 77 English, 78 Italian, 127 French and 240 Germans, making a total of seven hundred and thirty-six. The citizenship of many of the men studied has been hard to determine on account of the migration of teachers from country to country, which in the seventeenth, eighteenth and nineteenth centuries has been very common; but the above is a fair representation of the proper distribution of the men who have developed anatomy.

More than twenty-five professions are represented by the men who have been given a place in the list. In attempting to decide the position of a man in the following scheme it is not always easy, on account of the varied interests of some of them, to place them properly. Should Albrecht von Haller, for instance, be regarded as an anatomist, philosopher, poet, physiologist, botanist, or as an administrator, since he attained some eminence in all of these lines? Should Emanuel Swedenborg be classed as a philosopher, anatomist, geologist, civil engineer or theologian? In the present scheme Albrecht von Haller is arbitrarily regarded as an anatomist, although a very large share of his work was physiological. Swedenborg is regarded as a philosopher, for as such he is usually classed, although his anatomical writings were of a high type. Descartes is likewise regarded as a philosopher, although he might with justice be called a mathematician or anatomist. The subdivisions of histology and embryology are necessary since a few men specialized strictly in these branches of anatomical work, and they are known for their contributions to these subjects; such for instance as Balfour's noted studies in embryology and Corti's in histology.

The following list will show in a general way the numerical distribution of the men in various professions: 1 jurist, (Johannes Peyligk, who in 1499 published in Leipzig his "Philosophie Naturalis," which contains ten figures of separate organs of the body), 1 statistician, (Francis Galton), 1 beadle or exciseman (Leeuwenhoeck,[29] who for thirty-nine years worked as a subordinate customs officer or beadle at a salary equal to $125 per year. In spite of this meager income he contributed 375 papers to the Royal Society of London and 17 to the Academy of Science in Paris, besides making all of his microscopes), 1 pope (Innocent XII, who, working under the direction of Lancisi (1654–1720), is said to have been one of the first to observe, under the microscope, the circulation of blood in the capillaries); 1 prior, 1 journalist, 1 theologian (Caspar Bartholin, the founder of a professorial dynasty in the University of Copenhagen whose members taught in the university for one hundred and thirty-five years); 1 lawyer (Michel Alberti who contributed nearly 300 separate works on several phases of human knowledge); 1 bibliographer (Mangetus, "Bibliotheca Anatomica"), 1 clergyman (Wm. Buckland), 2 monks (of whom one was Gregor Mendel and the other Michael Servetus, a Spanish monk, the discoverer of the pulmonary circulation, which he published in 1553, seventy-five years before the appearance of Harvey's great work on the motion of the heart and the circulation of the blood); 3 physicists (Helmholtz and others), 5 poets (Mark Akenside, who wrote his inaugural dissertation on the fetus; Goethe, who is widely known for his papers in comparative anatomy, and for his homology of the intermaxillary bone of men and mammals; Lucius François Anderlini, a surgeon of Saint-Angelo, in the duchy of Urbino, who published in 1739 a poetical work "The Anatomist in Parnassus, or a Compendium of the Parts of the Human Body arranged in Verse"; Scipion Abeille, a military surgeon in Flanders who wrote, in 1689, a poetical anatomy on the parts of the head and neck; Albrecht von Haller was a poet of note, and many other men, interested in anatomical subjects, have been poetically inclined), 8 artists (Albrecht Dürer is well known for a work on human proportions which is of value from an anthropological standpoint; Michelangelo, working with Realdo Colombo (1494–1559), became deeply versed in human anatomy; Leonardo da Vinci, about 1510, completed a wonderful series of anatomical sketches, based on his own dissections); 5 ophthalmologists, 5 anthropologists (Blumenbach (1752–1840) was the founder of this science); 5 comparative anatomists, 6 embryologists, 7 pathologists, 9 histologists, 8 botanists, 14 paleontologists, 17 philosophers (Aristotle, Descartes, Swedenborg, etc.), 24 physiologists, 52 zoologists, 69 surgeons, 175 physicians, and 255 professional anatomists who devoted most of their attention to the teaching of anatomy.

---

[29] It should be noted that the following account is that of Sir Benjamin Ward Richardson, "Disciples of Æsculapius," Vol. 1, p. 111. Garrison, however, says in his "Introduction to the History of Medicine," p. 185, that Leeuwenhoeck was "an inheritor of well-to-do brewers (and) led an easy-going life."

It has not been possible to determine accurately the profession of many of the men included in the list, and for this reason many whose names are in the list are not classified here. For instance, Petrus d'Abano, who published in 1496 the first illustrations of the abdominal muscles, was either a physician or a professional philosopher, and probably the former, since Locy says the illustrations seem to have been based on a dissection. And there is a story concerning the large fees charged by Abano, which indicates that his profession may have been medicine, although his intellectual interests were chiefly philosophical. Bartholomæus Anglicus was probably a physician or a publisher. At any rate he published in 1485 one of the first printed illustrations (a wood cut) of any anatomical interest. Many surgeons have contributed to anatomy, and were really at the same time teachers of anatomy, such as Nicolas Ivanovitch Pirogoff, who wrote an enormous cross-section anatomy in five volumes, published in 1852; notwithstanding which he is classed in the list as a surgeon, since his anatomical teaching appears to have been incidental to his surgery.

The social status of the men who have developed anatomical knowledge has been difficult to determine because of scant biographical data. There is sufficient, however, to indicate that contributors to anatomical knowledge have been recruited from a wide range of social conditions. Some of them, and often the brightest, have lived in poverty. Others have been representatives of a much higher social class. It may safely be said that the study of biological matters has attracted attention of no special class, but that interest has been scattered. It may be said that the great majority of men who have developed anatomical knowledge have been men of moderate attainments, belonging to an average rank in the social scale. The above statements must be modified by the conditions under which the men lived and the age in which they lived. During the early centuries of the Christian Era living conditions in general were not so wholesome[30] as they have since become.

---

[30] Hirsch, August, "Handbook of Geographical and Historical Pathology," 3 vols.

Precocity and productiveness have gone hand in hand among the few anatomists who have exhibited these interesting traits; yet it is only fair to state that productivity has not been dependent on precocity. Such men as Bichat, Balfour, Haller, Vesalius, Johannes Mueller, Bernard Siegfried Albinus, Pollard, Sir Charles Bell, are rather unusual examples of precocity.

It may be of interest to give a few detailed accounts of some of these men. During the short period of seven years, beginning his career at the age of twenty-three, which Marie François Xavier Bichat (known as the father of histology) devoted to his scientific studies, he came to be recognized as one of the foremost biologists of all time. He exhibited unusual talents for prolonged and intense application to the pursuit of his favorite science. Besides editing the surgical writings of his teacher, Pierre Joseph Desault, in three volumes, he is himself the author of three separate works, any one of which would have secured him fame. Bichat's claim to recognition as a great biologist lies in his division, in 1800, of the tissues of the body into twenty-one non-microscopic varieties.

Francis Maitland Balfour ended his brief career at the same age as did Bichat, thirty-one; but during the few years he devoted to his favorite study of embryology he laid a secure foundation for lasting fame. Especially in his monograph on the development of the elasmobranch fishes and in his comparative embryology, he exhibited a broad grasp of the subject which has seldom been equalled in the same field of learning.

Andreas Vesalius, the great Flemish anatomist, descended from a family of learned physicians, began his study of anatomy at the age of fourteen with Dubois in Paris, and at the age of twenty-two was called to Padua to give public demonstrations in anatomy. His large work on human anatomy, "De corporis humani Fabrica," which earned him the title of the founder of modern systematic anatomy, was published when he was thirty. Although he lived for twenty years after its appearance he did little or nothing to develop anatomy save to issue successive editions of his "Fabrica." Three years before his death there appeared from the press at Madrid his edition of Fallopio's anatomy.

Albrecht von Haller, Swiss anatomist, physiologist, poet, botanist and administrator, deserves to be regarded as the most precocious and one of the most productive of all the men who have contributed to the advancement of anatomy. At the early age of eight he is said to have compiled a biographical index of over 2,000 eminent men and women. This prodigious activity he continued for the next sixty years, and it is stated that he conducted a monthly scientific journal to which he himself contributed 12,000 articles on nearly every phase of human knowledge. Nor were his contributions superficial, for Sir William Turner says that his anatomical descriptions and his beautiful and accurate figures were the most valuable which had appeared up to that time (1746–51). A list of his medical writings alone fills eleven octavo pages of closely printed type. Late in life he returned to Berne from Göttingen, where from 1736–1753 he had held the position as professor of anatomy, physiology, surgery and botany, to engage in his native land in municipal administration.

Johannes Mueller, who, in the first half of the last century, became famed as an anatomist, zoologist, and physiologist, became, at the age of twenty-five, professor extraordinary of physiology at the University of Bonn. He began an early career of prodigious activity, which he continued for thirty-three years.

Avicenna at the age of seventeen was regarded as an excellent physician. At twenty-one he was the author of several treatises. He was called "The Prince of Arabian physicians" by his contemporaries.

Bernhard Siegfried Albinus (1697–1770), for fifty years a teacher at the University of Leyden, was called to the University at the age of twenty-one, from Paris, whither he had gone on the advice of his father, to study medicine and especially anatomy with Winslow and Sénac. He had hoped to spend some years in Paris, but after six months, on the retirement of Rau from the professorship of medicine, anatomy and surgery at Leyden, Albinus was called, at the suggestion of Boerhaave, to take charge of the anatomy. Shortly after reaching Holland the University of Leyden gave Albinus his doctorate of medicine without either examination or thesis. His inaugural address "Oratio inauguralis de anatome comparata" clearly showed the master mind. At Leyden, Albinus gave a new direction to the study of anatomy which had lain dormant since the appearance of Vesalius's "De Corporis Humani Fabrica" (1543). He brought to greater perfection the art of anatomical illustrating, which had not progressed since Vesalius, and especially in his "Historia musculorum hominis, Leyden, 1734, in-4°", on which his fame as an anatomist rests. This magnificent work was twice reprinted and translated into French by Pierre Tarin in 1753. Albinus published also other valuable works and left a marked impression on his subject.

It would appear, from the above study, that the sources of anatomical literature are to be found in the writings of the men who have developed the subject in the various countries mentioned. The literature of anatomy has now attained sufficient dignity to warrant the preparation of a "Source Book," which would be very useful. Africa, aside from the Grecian incursion in the early centuries of the Christian era which resulted in the Alexandrian school, has produced no men of attainments in anatomy. South America has one man to its credit. Mexico and China have none. The literature of the rest of the world has radiated out from those European countries which have fostered our modern civilization. The outlook for an excellent type of anatomical literature in the future is better than it has ever been and the student who attempts to work in the field of the history of this literature will find himself among interesting and delightful surroundings.